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ABSTRACT

Internal reinforcement control is defined as one's belief that his rewards or punishments are contingent upon his own behavior. This study tested two main hypotheses: (1) that inconsistency in the home environment interferes with the development of internal reinforcement control, and (2) that internal reinforcement control can be increased by special teacher efforts in the classroom, and by group discussions or counseling outside the class. A secondary hypothesis was that internal reinforcement control relates positively to school achievement. The hypotheses were tested in four separate studies using subject population samples of elementary school pupils and college freshmen and sophomores. The studies assessed relationships between family environment, intelligence, school achievement and teacher counseling. The findings partly supported the first hypothesis. Internal reinforcement control was related to home environment, with sex differences. For males, a supportive, consistent home related positively to internality. For females, a somewhat rejectant home seemed to force independence and development of internal control. The second hypothesis was supported by the finding that feelings of internal reinforcement control increased in both early graders and college students after special counseling. The secondary hypothesis was supported for early graders, but not for college students. (Author/NH)

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A STUDY OF HOME ENVIRONMENT AND READINESS FOR ACHIEVEMENT AT SCHOOL

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April 1970

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A STUDY OF HOME ENVIRONMENT AND READINESS FOR ACHIEVEMENT AT SCHOOL

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The present research focused on some problems in education that have become especially acute since the recognition that educated manpower is a most valuable resource. To develop such a resource and to be more consistent with basic democratic principles, it has been accepted that everyone in the nation should be entitled to as much education as he is capable of absorbing. The realization of this goal has given rise to masses of students who reach our schools behaviorally unprepared to obtain optimum benefits.

One of the problems that schools have tried to cope with has been lack of motivation. However, with advancing knowledge in behavior sciences it has been possible to impart to the teachers the importance of motivation and the various methods that one may use to elicit it. That is, proper administration of reinforcement can be used to motivate and guide student behavior along desired channels. Despite this knowledge, though, there are too many instances where the traditional methods of motivating students have not worked and where after repeated attempts the teacher simply gives up trying and classifies the student either as one who lacks intelligence or as a bright underachiever. The research literature on underachievers is quite overwhelming. Yet, no general guidelines that may help the underachievers are readily apparent.

It was assumed in the present study that many students who come to our classrooms are not prepared to be motivated in the traditional manner. The home environments of such students have failed to provide the belief, feeling, or perception that the rewards or punishments that they receive are related to or are contingent on their own behavior efforts. That is, many students believe that their rewards and punishments occur independently of their own efforts. They have a belief in an external rather than an internal control of reinforcement. It is clear that such individuals would find it meaningless to have any plans or goals in education or life. For such children the process of education

is alien; it only deprives them of more immediate gratification in play or other behavior. The present study proposed to explore the correlates of internal-external reinforcement control, and the ways in which this variable can be modified.

Internal reinforcement control, defined as one's belief that his rewards or punishments follow or are contingent upon his own behavior, has been recognized as an important variable in many forms of learning (Rotter, 1966). Crandall, et al. (1965), and McGhee and Crandall (1968) have shown a positive relationship between internal reinforcement control, achievement striving and academic performance. The results of a study by Reimanis (1970) suggested that external reinforcement control interfered with teachers' efforts to increase achievement striving in the classroom. Rotter (1966) reports that research by Graves, and by Jessor suggest that cultural learning and socialization factors at home may be important contributors to the acquisition of internal control. Lefcourt (1966) suggests that lack of internal control may be a by-product of poverty, and racial and cultural barriers.

Two main hypotheses were tested by the present study. First, it was hypothesized that inconsistency in the home environment interferes with the development of internal reinforcement control. Second, it was hypothesized that increments in internal reinforcement control can be produced by special teacher efforts in the classroom and group discussions or counseling methods outside the class. A secondary hypothesis was that internal reinforcement control relates positively to school achievement.

Summary of Method

The hypotheses were tested in four separate studies. More detailed description of the method is provided with the presentation of each study. The present section presents a general summary or overview of the research.

Two subject populations were sampled: elementary school pupils and community college freshmen and sophomores. In the first study, forty-eight parents and 101 first and third graders were used to assess relationships between internal reinforcement control measures, school achievement, home environment, and the

effect of teacher counseling. In the second study, 201 children from another school were used in grades three through six to assess relationships between three main measures of internal reinforcement control, intelligence, achievement, and family circumstances. In the various phases of the third study, 915 community college freshmen were used as subjects to assess the effects of group and individual counseling on internal reinforcement control, and to assess the relationships between internal control, perceived home environment, and academic achievement. The fourth study used 237 community college freshmen and sophomores and assessed the effect of achievement motivation training on internal reinforcement control.

STUDY I: Elementary School

Method

Four classrooms, two first and two third grades with twenty-three to twenty-five children in each, were selected as samples from a school in a small city in southern New York State. The first grade was selected in order to have children who are at the beginning of the socialization stage where school and other outside-the-home activities play an increasingly important role in the child's social development. The third grade was selected because past research has shown that at this age children possess internal reinforcement control which has a relationship to school achievement (McGhee and Crandall, 1968). Secondly, better measuring devices for internal control exist for the third grader than for earlier grade levels.

After the selection of the children, forty-eight parent interviews (about half the parent population) were arranged to assess the child's home environment with respect to the following variables:

Residential mobility

Parents' occupation

Satisfaction with lot in life

Amount of major worries in the family

Amount of time parents have been separated from child

Number of children in family

Parent views about child's general behavior (favorable vs. unfavorable)

Amount of interest in child's work at school

Amount of praise given for good grades

Child's ability to confide in parents

Amount of independence encouraged in child

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Amount of training given to control child's feelings

Degree to which child is trusted

Degree to which punishment depends on mood

Degree to which parents express feelings openly toward child

Frequency of temper flare-up toward child

Concern for child's welfare and future

Degree to which parents have definite goals in life

Parents' view of child's goals

Harmony among siblings in the household

Respect of parents for each other

These variables were rated on a scale from one to six. Practically all the interviews were carried out with the mother. There was an interscorer agreement of 81% on five selected items from the interview protocols.

To assess internal reinforcement control in the first grade a cartoon-type open-ended questionnaire consisting of six items and developed by Battle and Rotter (1963) was administered individually. All children were assigned code numbers and the tests were scored by an assistant not knowing which children belonged to the experimental or control groups. The interscorer agreement on the first fifty test scores was 91%.

For the third grades, in addition to the cartoon-type questionnaire, a twenty-three item objectively scored scale developed by Bialer (1961) was used. On this scale the child answers with a "yes" or a "no" to items such as: "Do you really believe a kid can be whatever he wants to be?" The items were read to each child. In addition to these measures, both the first and third grade teachers were requested to rate the children on internal control on basis of their observations in the classroom.

On basis of the internal control questionnaire scores and teachers' ratings, children in the lowest quartile in each of the

groups were selected for further study. Five children from one section at the first grade level and five from one section at the third grade level were selected for experimental groups. The five lowest in the two other sections were identified as control subjects. There was little agreement between the teachers' ratings of the children and the two scales. As a result, since teachers were to be counseled, and since they would focus on the experimental children in a classroom context, the teachers' evaluation of the children was given preference in deciding which children were lowest on internal reinforcement control.

Over a period of three months the research director held weekly meetings with the experimental group teachers. During these meetings methods were discussed on how one may modify the classroom procedures to help the children develop a feeling of internal control. The teachers in the experimental groups were aware of which were the lowest five children and, as time permitted, gave these children more individual attention with respect to learning about their behavior consequences and consistency in the environment around them. During the weekly counseling sessions it became apparent that the teachers could not pay close attention to more than three children each. One more child was eliminated because of extended illness. Thus the final total experimental group had five children: two girls and three boys. During the latter half of the counseling sessions reinforcement principles were used with each of the children. What appeared to be reinforcing to each child was identified and then the teachers attempted to use this in order to point out behavior-effect contingencies. After the three month period all children were retested on internal control.

Other relevant data, such as the child's school achievement, were obtained from school records and teacher interviews. Some of the data was not complete for the third grade control group, since the class underwent a change in teachers while the study was in process.

Results and Discussion

Home environment and internal control

The correlation coefficients presented in Table 1 partly supported the first hypothesis. From the significant correlations between internal reinforcement control measures and home environment

TABLE 1

Correlation Coefficients for Boys and Girls
Between Internal Reinforcement Control Measures
and Home Environment Scores

Home Environment Items	Battle scale[1]		Bialer scale	
	Boys[2]	Girls	Boys	Girls
1. Residential mobility since child was 3 6 = no moves 1 = five or more moves	+.30[3] +.76**	-.73* -.34	 -.20	 +.36
2. Father's occupation level 6 = senior executive 2 = unskilled 1 = unemployed	-.55* -.18	+.32 +.05	 -.14	 -.20
3. Parents' satisfaction with lot in life 6 = complete satisfaction 1 = complete dissatisfaction	-.25 +.51	-.21 +.22	 +.02	 +.25
4. Amount of worries in family 6 = none 1 = many	-.32 -.06	-.19 -.27	 -.08	 -.33
5. Frequency of separation from child 6 = none 1 = often	+.22 -.07	-.07 +.03	 +.28	 +.12

* significant at .05 level ** significant at .01 level

[1] Note that Battle I-E scale is scored in the direction of externality, i.e., smaller score means more internality.

[2] N = 14 for male first graders and female third graders
N = 11 for male third graders
N = 9 for female first graders

[3] First line represents correlations for 1st grade and second line for 3rd grade.

TABLE 1 cont.

Home Environment Items	Battle Scale		Bialer Scale	
	Boys	Girls	Boys	Girls
6. Number of children in family	-.15	+.50		
	+.69*	-.60*	+.35	+.24
7. Parents' view of child's behavior	-.34	-.40		
6 = positive 1 = negative	-.03	+.31	-.30	+.64**
8. Amount of interest in child's schoolwork	+.08	-.13		
6 = every day papers 1 = never	-.07	-.17	-.02	-.30
9. Amount of praise given for grades	-.39	-.27		
6 = large rewards 1 = none	-.48	+.10	+.36	-.45
10. Child's ability to confide in parents	-.24	-.48		
6 = always 1 = never	+.37	-.38	+.34	+.09
11. Amount of independence encouraged	-.24	-.28		
6 = complete 1 = none	+.08	+.34	-.39	-.06
12. Amount of training to control child's feelings	+.33	-.62		
6 = much 1 = none	-.12	-.06	+.61*	+.15
13. Degree to which child is trusted	-.01	-.11		
6 = much trust 1 = none	+.38	-.06	-.26	-.20

TABLE 1 cont.

Home Environment Items	Battle Scale		Bialer Scale	
	Boys	Girls	Boys	Girls
14. Degree to which punishment depends on mood	+.07	+.46		
6 = large degree 1 = never	+.18	+.08	-.64*	+.07
15. Degree to which parents' feelings are expressed openly. 6 = always open	-.03	+.00		
1 = never	+.04	+.29	+.27	+.06
16. Frequency of parent temper flare-ups	+.00	+.02		
6 = frequenly 1 = never	+.12	-.04	+.20	-.36
17. Concern for child's welfare and future	+.21	-.22		
6 = much concern 1 = none	-.67*	+.25	-.07	-.25
18. Degree to which parents have definite goals	-.03	+.68*		
6 = definite goals 1 = none	-.23	+.14	+.02	+.07
19. Goals for children	+.31	-.26		
6 = college education 1 = none	-.05	+.51	+.21	-.19
20. Harmony among siblings	-.47	+.29		
6 = most of the time 1 = never	+.21	-.06	+.24	+.03
21. Respect of parents for each other. 6 = high	-.17	+.20		
1 = no respect	-.20	+.06	+.11	-.17

items 2, 7, 14, 17 it can be seen that a stable, supportive home environment related positively to internal control. The significant correlations between internal control scales and items 12 and 18 were more difficult to interpret. Item 12 may suggest that too much training to control one's feelings may inhibit the child's exploration of his own behavior consequences and thus lead to lower internal reinforcement control. Item 18 may suggest that when parents have very definite goals set for themselves, the child may not have a chance to observe goal-setting and planning behavior at home. He cannot observe what needs to be done to modify goals and what actions need to be taken to reach the goals. The samples were rather small and thus prevent speculation about correlation coefficients not reaching the .05 significance level. There appear to be enough differences between boys and girls and between the first and third grades to preclude the possibility of combining the groups in order to increase the sample size.

Interesting sex differences were present in relationships between internal control and items 1 and 6. On item 1, it seems that a high degree of residential mobility interfered with the development of internal control in girls, but seemed to aid such development in boys. It is possible that residential mobility is often connected with father's employment change. Thus a boy, identifying with his father, may see such a change as a planned step toward general improvement. Perhaps a girl, identifying with her mother, may see residential mobility as creating temporary chaos with household duties and as an act which is necessary in order to travel along with the bread-winner in the family. If the decision to move is mainly that of the father, then the reason why mother has to move could be seen as externally determined. It is also likely that it takes longer for the mother to readjust to a new neighborhood and friends; the father's readjustment could be easier or more natural since he spends much of his time at work and this may be where he forms his new friendships.

The other relationship presenting sex differences had to do with number of siblings. Here it may be possible that for the boy in a larger family there is more competition for father's attention. Possibly the father cannot provide enough consistent interaction with all his children. Furthermore, consistent independence training, which in our culture is stressed more for boys and which probably helps to develop internality, cannot be practiced in a large family as well as in a smaller one. With respect to girls, the larger family may provide more opportunity

for identifying with her mother by trying out "motherly" behaviors either in helping the mother with dishes or other things or assuming a "motherly" role with younger siblings. It is also likely that in a larger family it is more difficult for the girl to take on the more traditional female role of dependency, since attention and nurturance has to be divided among a number of children. In such a case the girl has to learn to rely more on herself for need satisfaction and thus has to know what the behavior-effect contingencies are in a particular setting.

School achievement and home environment

There were only six significant ($p < .05$) correlations between grades and home environment ratings. That is about the number that one might expect by chance at the five per cent level from the 126 computations carried out between the home environment items and three achievement scores in the first and third grades. Thus, perhaps partly because of the small samples (from ten to twenty-three), it seems that no definite relationships were present. The positive correlations were between reading grades, frequency of temper flare-ups (3rd grade $r = +.64$, $N = 12$), parent respect for each other (1st grade $r = +.41$, $N = 23$), and parents' interest in child's school work (1st grade $r = +.55$, $N = 23$). Negative correlations were between reading grades and number of children in family (1st grade $r = -.82$, $N = 23$), and between writing grades and degree to which punishment depended on mood (1st grade $r = -.65$, $N = 10$; 3rd grade $r = -.62$, $N = 12$).

Effect of counseling on internal control

The second hypothesis was supported partly by the finding that the five experimental subjects increased significantly in internal control after the three months of weekly counseling sessions with teachers. The children's scores on the Battle scale decreased from 16.60 to 11.40, i.e., they moved in the direction of internality. The difference was significant at the .05 level ($t = 3.53$). Since only three of the children were from the third grade and the Bialer scale was administered only to the third grade, comparisons could not be made on the Bialer scale. Two of the experimental children increased and one decreased on this scale. The experimental group could not be compared with the

control group directly because the experimental group children were selected on basis of their scores on the internal reinforcement control scales and teacher ratings. There were no significant correlations between the teachers' ratings of internality and the scores on Battle or Bialer scales. This lack of correlation was probably due to the fact that the teachers' ratings depended mainly on the child's behavior in the class, while Battle's and Bialer's scales consider primarily outside-the-classroom factors in their items. The fact that the children were not selected only on basis of the Battle scale explains why the pre-treatment mean was only 16.60.

When the experimental group was compared with a sample of ten subjects, five from third grade and five from first grade and matched on their Battle scale scores from the pre-test, the experimental group showed a significantly ($p < .05$) greater change toward internality. The experimental group changed from 16.60 to 11.40 while the matched control group changed from 16.00 to 16.20 ($t = 2.78$).

Even though it seemed that the high scorers in pretest decreased in their scores during the post-test and vice versa, there were significant ($p < .01$) correlations between the pretest and post-test Battle and Bialer scale scores. The correlations were +.39 for the Battle and +.46 for the Bialer scales with Ns of fifty each.

There were no significantly different changes in internal control between the total experimental and control classrooms or between males and females. The pre- and post-treatment means for the third grade, respectively, on Bialer's scale were 13.40 and 14.12 for the control class, and 13.76 and 13.60 for the experimental class. The means on the Battle's scale were 13.88 and 13.44 for pre- and post-control third grade; 13.88 and 14.12 for pre- and post-experimental third grade; 15.14 and 14.14 for pre- and post-control first grade; 12.88 and 12.58 for pre- and post-experimental first grade.

From records of weekly counseling sessions it was quite apparent that all five children in the experimental group showed much more behavior that would be associated with internal control toward the end of the sessions than at the beginning. At the end of the sessions the special focus children appeared to know and be interested in what they were doing. They were more part of their class projects and the teachers could rely on them more.

At the beginning of the sessions these children appeared quite different. Some did not appear to be part of the class. Some showed inappropriate behaviors in the class. Some showed complete lack of interest in classroom activities. And some demanded constant attention from the teacher.

School achievement and internal control

Results in Table 2, presenting correlations between school achievement and internal control, supported the secondary hypothesis. There was a positive relationship between school achievement and internality. The significant correlations were small, but consistently in the predicted direction. For computations in this case boys and girls were combined since there appeared to be no differences between the separate correlations for boys and girls.

TABLE 2

Correlations Between Internal Control Scores and School Achievement

		Battle Scale		Bialer Scale	
		N	r	N	r
Mathematics	1st grade	48	-.36*		
	3rd grade	25	+.27	25	+.34
Reading	1st grade	46	-.29*		
	3rd grade	25	+.31	25	+.47*
Writing	1st grade	22	-.18		
	3rd grade	25	+.19	25	+.41*

* significant at the .05 level

Note: Battle scale is scored in the direction of externality.

STUDY II: Elementary School

Method

Two hundred and one elementary school pupils in grades three through six were used as subjects. The subjects came from two rural schools in New York State. The main purpose of this study was to examine interrelationships between internal control, intelligence, school achievement, and home environment. To assess internal control the same scales were used as in Study I. In addition, the Intellectual Achievement Responsibility (IAR) Scale was also included. This scale has been developed at the Fels Research Institute (Crandall et al., 1965), and is subdivided into scales measuring acceptance of responsibility for academic success (IAR+), for academic failure (IAR-), and a total scale (IAR T). The IAR scales deal primarily with school performance. The child is asked to choose from two alternatives to answer a question such as "If the teacher passes you to the next grade, it would probably be a) because she liked you, or b) because of the work you did." The test items were read to children in grades three and four; in grades five and six the children read the items themselves.

Other data collected were: teachers' ratings of children's achievement on a scale one to three; ratings of child's family circumstances on a scale one to four, a score of one representing a very unstable home and four representing a very stable home; California Test of Mental Maturity to assess intelligence; and information regarding whether the child lived with both of his parents, one parent, grandparents, or others.

All of the data in this study was collected by an assistant. The Battle scale was scored by the same person as in Study I.

Results and Discussion

As can be seen in Table 3, the various measures of internal reinforcement control did not show strong intercorrelations. All of the significant correlations, however, were in the expected direction. That is, all of the measures had something in common. High correlations were not expected because the instruments were

TABLE 3

Intercorrelations of Internal Control Measures

Grade	Bialer vs. Battle Scale				Battle Scale vs. IAR+			
	Boys		Girls		Boys		Girls	
	N	r	N	r	N	r	N	r
3	21	-.08	26	+.00	20	-.45*	24	-.00
4	26	+.07	14	+.22	26	-.16	14	-.00
5	18	-.01	23	-.12	19	+.00	24	+.00
6	18	-.40	20	-.10	17	-.00	18	-.53*
	Bialer Scale vs. IAR+				Battle Scale vs. IAR-			
3	22	+.22	25	+.06	20	-.00	24	-.13
4	27	+.12	16	+.18	26	+.00	14	-.38
5	19	+.19	30	-.29	19	+.00	24	-.34
6	22	+.21	18	+.38	17	+.00	18	-.33
	Bialer Scale vs. IAR-				Battle Scale vs. IAR T			
3	22	+.36	25	-.00	20	-.20	24	-.11
4	27	-.00	16	+.13	26	-.00	14	-.25
5	19	+.14	30	+.00	19	+.00	24	-.24
6	22	+.50*	18	+.00	17	+.00	18	-.48*
	Bialer Scale vs. IAR T				IAR+ vs. IAR-			
3	22	+.43*	25	+.00	25	+.15	26	+.00
4	27	-.00	16	+.17	27	+.21	17	+.57*
5	19	+.19	30	-.11	23	+.47*	32	+.19
6	22	+.42*	18	+.15	22	+.46*	18	+.00

* significant at .05 level

basically different. This is true especially in comparing the Battle and Bialer scales which focus on general locus of control situations in the child's life, with the IAR scales which deal primarily with school situations. The largest number of significant correlations were between the two subscales of IAR.

Table 4 presents correlations between intelligence scores and the various measures of internal control and home environment. From the significant correlations it is apparent that intelligence correlated positively with internal reinforcement control. That is, the more intelligent the child the easier it may be for him to discover and learn behavior-effect contingencies. In the same table, it can be seen that intelligence related positively to better home environment.

Results in Table 5 offer some support for the secondary hypothesis that achievement is related positively to internal control. From the nine significant correlations, however, there are two for boys and one for girls that are in the opposite direction. The third and sixth grade boys with Battle's scale, and fifth grade girls with IAR-, present the opposite relationship. The negative relationships between IAR- and school achievement could be due to the possibility that students having better grades have had less chance to assume responsibility for intellectual failure. The IAR- measured degree of responsibility that one would accept for failure. Is it also possible that the best home environment, not presenting any problems, may not give the boy enough chance to experiment with his own behavior contingencies? Is it possible that sometimes the child who has external reinforcement control causes less problems in the classroom and thus receives a higher achievement rating? In the present data there is not enough consistency one way or another to speculate further on these possibilities. The largest correlations appeared to be between school achievement and the IAR scales. This was expected since the IAR scales were more applicable to school situations.

In comparing achievement ratings with home environment, only the correlation coefficient for fifth grade girls was significant ($r = +.44$, $p < .05$, $N = 33$). Five of the other seven correlations were positive.

The best predictor of the child's school achievement was his intelligence as measured by the California Test of Mental Maturity. Table 6 presents the correlations between intelligence and achievement level in the four grades. Because of the large

TABLE 4

Correlations Between Intelligence Scores
and Measures of Internal Control and Home Environment

Grade	Battle Scale				Bialer Scale			
	Boys		Girls		Boys		Girls	
	N	r	N	r	N	r	N	r
3	21	+.20	26	+.19	23	+.09	27	-.33
4	24	-.12	19	-.31	25	+.05	16	+.00
5	16	-.45	22	-.24	17	+.53*	29	+.41*
6	17	+.54*	19	-.18	23	-.13	20	+.45*
	IAR+				IAR-			
3	25	+.13	25	+.36	25	-.09	25	+.00
4	25	+.53**	17	+.16	25	+.39	17	-.00
5	20	+.24	30	-.20	20	-.00	30	+.09
6	21	+.44	17	-.00	21	+.24	17	+.28
	IAR T				Home Environment			
3	25	+.11	25	+.23	25	+.30	27	+.06
4	25	+.56**	17	+.00	27	+.66**	17	+.00
5	20	+.11	30	-.00	20	-.00	31	+.49**
6	21	+.38	17	+.21	23	+.16	19	-.11

* significant at the .05 level

** significant at the .01 level

TABLE 5

Correlations Between Internal Control Measures and School Achievement

Test	Third Grade				Fourth Grade				Fifth Grade				Sixth Grade			
	Boys		Girls		Boys		Girls		Boys		Girls		Boys		Girls	
	N	r	N	r	N	r	N	r	N	r	N	r	N	r	N	r
Battle Scale	22	+.47*	27	-.12	26	-.06	14	-.10	19	-.37	24	+.09	18	+.50*	20	+.27
IAR+	25	-.19	26	+.38*	27	+.47*	17	+.19	23	+.30	32	+.54**	22	+.21	18	-.24
IAR-	25	+.15	26	+.36	27	+.34	17	+.03	23	+.08	32	-.44*	22	+.40	18	-.26
IAR T	25	+.18	26	+.49**	27	+.50**	17	+.11	23	+.11	32	-.30	22	+.36	18	-.35
Bialer Scale	23	+.14	28	+.20	27	+.05	16	+.32	19	+.47*	31	+.19	24	-.07	22	+.36

* significant at the .05 level

** significant at the .01 level

TABLE 6

Correlations Between Achievement Level and Intelligence

Grade	Boys		Girls	
	N	r	N	r
3	26	+.83**	29	+.28
4	25	+.87**	17	+.86**
5	20	+.69**	31	+.52**
6	23	+.62**	20	+.40

* significant at the .05 level

** significant at the .01 level

correlation, it may be possible that much of the relationship between internal control and achievement as shown in Table 5 was due to the positive relationship between intelligence and internal control (see Table 4).

Table 7 presents correlations between the various measures of internal control and home environment ratings, and mean values of these variables. It can be seen that two of the three significant correlations indicate a positive relationship between internal control and good home environment. For girls in the third grade, however, there was a negative relationship between the IAR+ and home environment. Is it possible that a less favorable home environment may sometimes require the girls to acquire more independence and they thus become familiar with more behavior-effect contingencies? The results, at least in this sample, however, do not consistently support this supposition.

There were no significant differences between the means of the variables presented in Table 7.

TABLE 7

Correlations Between Home Environment and Internal Reinforcement Control

Test	Third Grade				Fourth Grade				Fifth Grade				Sixth Grade			
	Boys		Girls		Boys		Girls		Boys		Girls		Boys		Girls	
	N	r	N	r	N	r	N	r	N	r	N	r	N	r	N	r
Battle	20	-.05	27	+.21	26	-.03	14	-.19	17	+.43*	24	+.36	18	+.32	19	+.10
Mn:	14.65		13.83		16.46		14.57		16.24		16.46		15.00		15.79	
IAR+	24	-.30	24	-.46*	27	+.49**	17	+.45	21	+.13	32	+.05	22	+.13	17	+.09
Mn:	13.50		13.29		12.48		12.29		12.62		13.34		12.77		13.06	
IAR-	24	+.12	24	+.00	27	+.06	17	+.08	21	+.23	32	-.24	22	-.11	17	-.05
Mn:	12.13		11.75		10.85		10.18		11.76		11.69		12.27		12.41	
IAR T	24	-.02	24	-.24	27	+.31	17	+.27	21	+.20	32	-.15	22	+.01	17	-.00
Mn:	25.54		25.05		23.33		22.47		24.38		25.06		25.05		25.47	
Bialer	22	+.20	26	-.09	27	-.09	16	+.55*	17	-.02	31	-.03	24	+.07	20	+.04
Mn:	14.04		12.77		13.11		13.19		15.30		14.61		14.21		15.60	

* significant at the .05 level

** significant at the .01 level

There were no significant differences in grades or internal control measures when children living with both parents were compared with those living under other circumstances, such as with grandparents, one parent, step-parents, or others. The latter group was considered as a whole since the small samples precluded further separation.

STUDY III: College Freshmen

Method

Community college students were used as subjects in this study because of the belief that even at this level many students to whom education is now available have not acquired in the past a feeling of internal reinforcement control. The college had an open-door admissions policy and was located near a small city in southern New York State. Internal reinforcement control was measured with an internality-externality scale (I-E) appropriate for this age level (Rotter, 1966). The scale has twenty-three items and six buffer items. In this study the scale was scored in the direction of internality. The subjects chose one alternative from pairs of items such as: "One of the major reasons why we have wars is because people don't take enough interest in politics," and "There will always be wars, no matter how hard people try to prevent them." For one hundred and one of these students, forty-seven males and fifty-four females, home environment was measured with the (CEQ) questionnaire (Reimanis, 1966), designed to assess home consistency, harmony, and neighborhood variables. The students responded by indicating agreement or disagreement on a scale one to six on items such as "I know from my personal experience as a child what it is to have a father who does not have any definite goals in life."

The I-E scale was administered to 218 students in randomly selected Freshman English classes.

On basis of the I-E scores forty students from the lowest fifth were selected for further study. Twenty of these were randomly selected for the experimental and twenty for the control group. The experimental group was further divided into three groups of six to seven in each, and received weekly group counseling with the goal of increasing belief in internal control. The subjects were divided into the three counseling groups on basis of available free time. Perhaps because the low internal control student finds little meaning in education or counseling, and because many of them had very complex home and school problems, it was possible to conclude the counseling sessions with only one group of six students, three males and three females.

Repeat data were available on fifteen of the twenty control subjects. After six weeks of weekly counseling the experimental group, the control group, and a random sample of ninety other students were retested on the I-E scale.

Because of the large attrition in the experimental group, a second sample of low internal control students was selected for a similar study during the following year. The procedure was the same except that over a ten-week period individual rather than group counseling was used, and the subjects were selected from the lowest tenth of the I-E scores of 697 students. The second study was concluded with six students, three males and three females, from the initial eight in the experimental group, and with seventeen in the control group.

In the group counseling sessions, the subjects were encouraged to talk about themselves and some of their problems. During the first few sessions, the counselor confronted the students with such statements as, "What could you have done about it?" or "Why did you let them take advantage of you?" or "What do you want to do?" After a while the other group members picked up this theme and confronted one another in turn. With each confrontation the counselor attempted to replace an external control statement made by the subject, such as "I am in college because my father wants me to be an optometrist," with an internal one, such as "I want to learn more about people" or whatever it may be.

In the second part of the study, using individual counseling with a new sample of eight experimental subjects, the counselor asked each subject at the beginning of the experiment to make a commitment for a 45-minute counseling session per week over a ten-week period. It was found later that two thirty-to-forty minute sessions per week seemed to work better.

In the initial sessions each subject was encouraged to talk about himself. Specifically he was asked about his vocational goals, his educational goals, and his previous schooling. Attempts were made by the counselor to facilitate conversation using non-directive techniques. As the sessions progressed specific problem areas became apparent. In each case the subject was asked to explain more thoroughly the problems he brought out. At each external response the subject gave, the counselor interrupted and asked the subject to analyze the statement: why he said what he said and what he could have done to prevent what happened. The attempt, again, was to replace an internal response

for the initial external one made by the subject. In addition, the subject was encouraged to transfer the internal thoughts to future events. That is, now that he knows what he could have done, what will he do in the future?

Results and Discussion

The I-E scale in the present study had a moderate degree of reliability. An r of +.70 was obtained from 151 subjects when the scale was readministered after a three to six month period. When the scale was subjected to Guttman scale analysis, using 101 subjects, its reproducibility was 86.41%.

Effect of counseling on internal control

Results from the first sample show an increase in internal control, significant at the .01 level ($t = 2.57$) for the six experimental subjects. The mean change was from 7.33 to 11.00 on the twenty-three item scale. (Note that in the present scoring method a higher score indicates more internality.) There was a slight increase in the controls (7.59 to 9.73), but the change was not significant. The increase in the experimental subjects, however, was not significantly greater than that for the controls. A random sample of ninety subjects neither in the control nor experimental group showed practically no change over the six week period. The means were 14.24 and 14.15.

Results from the second sample, available from six of the eight experimental subjects, showed a mean increase in internal control from 5.80 to 13.40, a difference significant beyond the .01 level ($t = 5.21$). The seventeen control group subjects showed a mean change from 6.88 to 6.35. The increase in the experimental group was significantly greater ($p < .01$) than that for the control group.

Combining the data from the two parts of this study, the second hypothesis was supported. The mean increase in the experimental group (from 6.58 to 12.17) was significantly ($t = 3.71$; $p < .01$) greater than that in the control group (from 7.20 to 7.80).

Counseling procedures oriented toward strengthening the perception of behavior-effect contingency produced significant increases in internal control as measured by Rotter's I-E scale.

From counseling records it was quite apparent that most of the students talked much more about their own responsibility in continuing their education and solving their interpersonal problems toward the end of counseling than they did at the outset. Toward the end of the sessions a number of the students also moved behaviorally in the direction of internality. Examples were: taking own apartment, changing programs, seeking out instructors to find out where they stood in a course and what they needed to do in order to get a good grade, etc.

Grade-point average and internal control

No increase in grade-point average accompanied the increase in I-E scores. The grade-point averages for three semesters, one during and two following the counseling, were the following: 2.32, 2.34, 2.33.

There was no significant relationship between scores on the I-E scale and grades in general. In a sample of 218 students, the I-E scores in the fourth quartile, the third, second, and first quartile, respectively, had the following mean grade point averages: 2.35, 2.38, 2.37, and 2.34. Thus, the secondary hypothesis predicting a relationship between academic achievement and internal control was not supported. This finding of no relationship was in line with other research on college students (Crandall, 1969).

Home environment and internal control

Table 8 presents correlation coefficients between the I-E scale and CEQ items. From this table it can be seen that the results for males supported the first hypothesis. Items that correlated significantly with I-E suggested a warm, supportive, consistent home environment. Items with negative correlations suggested an inconsistent environment.

For females, however, there were only four significant ($p < .05$) correlations on the fifty-two items. Internality seemed

TABLE 8

Correlation Coefficients Between I-E Scores and CEQ Items for 47 Male and 54 Female Students

CEQ Items ("I know from my personal experience as a child what it is:")	Males	Females
To live in one of the best residential sections.	+.10	-.25
To do a lot of moving from one place to another.	+.07	-.03
To have parents whose religion is different from that of most people.	-.14	+.15
To have parents who are highly respected in the community	+.24	-.20
To have poor parents who can afford no more than the bare necessities.	+.05	+.12
To live in one of the "worst" or "toughest" neighborhoods.	-.16	+.01
To have parents who live and admire each other.	+.31*	-.16
To have a house filled with worry (about finances, ill health, or anything else).	-.18	+.01
To be the black sheep in the family.	-.24	-.08
To have parents who quarrel (argue with one another).	-.36*	+.12
To have a mother with the same ideals that I have accepted and made mine.	+.10	-.13

* significant at the .05 level

** significant at the .01 level

TABLE 8 cont.

CEQ Items	Males	Females
To have a mother who is disappointed with her lot in life.	-.26	+.14
To have a mother who thinks highly of me.	+.39**	+.02
To have a mother who has been more interested in herself or in other things than she has been in me.	-.33*	+.18
To have a mother who acts as if she does not care for me.	-.37**	+.28*
To have a mother who praises her children when they get good grades in school.	+.08	-.21
To have a mother who does not appreciate me.	-.37**	+.03
To have the kind of mother that children always feel free to confide in about everything they do.	+.35*	+.13
To have a mother with whom I have little in common.	-.34*	+.10
To have a mother who put a lot of emphasis on getting good grades in school.	+.10	-.00
To have a mother who encouraged me to make my own decisions, to try things on my own early in life.	+.22	-.07
To have a mother who always expressed her feelings openly, rather than keeping them to herself.	+.19	-.07
To have a mother with a violent temper which she would let out at me when I did something she didn't like.	-.12	-.12

TABLE 8 cont.

CEQ Items	Males	Females
To have a mother who put a lot of emphasis on the importance of controlling feelings.	-.05	-.16
To have a mother whose punishments depended on what mood she was in.	-.03	-.05
To be separated from my mother for long periods of time.	-.12	+.20
To have a mother who is sick much of the time.	-.06	+.02
To have a mother who distrusts me (believes that I do things behind her back).	-.17	-.09
To have a mother who never really wanted me to achieve anything in life.	-.49**	+.10
To have a mother who does not have any definite goals in life.	-.37**	+.14
To have a mother who always set my goals so high that I could never really reach them.	-.36*	-.07
To have a father with the same ideals that I have accepted and made mine.	+.29*	-.18
To have a father who is disappointed with his lot in life.	-.11	+.17
To have a father who thinks highly of me.	+.40**	-.12
To have a father who has been more interested in himself or in other things than he has been in me.	+.01	+.17
To have a father who acts as if he does not care for me.	-.21	+.13
To have a father who praises his children highly when they get good grades in school.	+.38**	-.31*

Table 8 cont.

CEQ Items	Males	Females
To have a father who does not appreciate me.	-.15	+.17
To have the kind of father that children always feel free to confide in about everything they do.	+.33*	+.02
To have a father with whom I have little in common.	-.15	+.28*
To have a father who put a lot of emphasis on getting good grades in school.	+.25	-.15
To have a father who encourages me to make my own decisions, to try things on my own early in life.	+.44**	-.13
To have a father who always expressed his feelings openly, rather than keeping them to himself.	+.38**	-.10
To have a father with a violent temper which he would let out at me when I did something he didn't like.	-.15	-.05
To have a father who put a lot of emphasis on the importance of controlling feelings.	+.29	-.14
To have a father whose punishments depended on what mood he was in.	-.12	-.04
To be separated from my father for long periods of time.	-.13	+.25
To have a father who is sick much of the time.	+.05	+.06
To have a father who distrusts me (believes that I do things behind his back).	-.36*	-.26*
To have a father who never really wanted me to achieve anything in life.	-.23	+.03

TABLE 8 cont.

CPQ Items	Males	Females
To have a father who does not have any definite goals in life.	-.11	+.04
To have a father who always set my goals so high that I could never really reach them.	-.14	-.07

to correlate positively with items showing a rejectant home environment. It may be that warm and accepting families raise daughters according to the belief that the female should be more dependent on others. This also seems to agree with the notion that male children internalize cultural or social norms, whereas females regard the norms as external restrictions. Perhaps in instances where the home environment is rejectant the daughter is forced to be more independent and thus learns her own behavior-effect contingencies better in order to satisfy her wants. This finding and explanation are similar to those briefly mentioned in Studies I and II.

The data on males was also factor-analyzed using the BMD03 General Factor Analysis program (Dixon, 1968). The items appearing in the same factor with I-E, showing positive loadings greater than .300, were:

> To have a father who put a lot of emphasis on getting good grades in school.
>
> To have a father who praises his children highly when they get good grades in school.
>
> To have a father who always expressed his feelings openly, rather than keeping them to himself.
>
> To have a mother who put a lot of emphasis on getting good grades in school.

Items with negative loadings were:

> To have a father who never really wanted me to achieve anything in life.
>
> To have a father who does not have any definite goals in life.
>
> To have a mother who is disappointed with her lot in life.

The data were not factor analyzed for females since only four of the fifty-two items correlated significantly with the I-E scale.

STUDY IV: College Freshmen and Sophomores

Method

The subjects were 237 male and female students drawn from the same population as subjects in Study III. One hundred and fifty-one had enrolled in six groups of achievement motivation training during one-week summer sessions, and eighty-six were in four groups of two-weekend sessions during the fall semester. The 151 subjects had been invited to participate in the achievement motivation training program from a group of high risk students who on basis of past research with high school averages and SAT scores as predictors were not expected to complete their two-year programs at the college. The eighty-six subjects were students who volunteered to undergo the training, for which the college granted three semester hours of credit.

The achievement motivation training sessions were patterned after Anschuler's work (1970). The course exposed the student to personal interaction with other students and to various achievement strategies and thoughts. Through participation in game situations, the student was given a chance to explore his own level of aspiration and achievement thoughts. The course was designed and offered for the purpose of helping students adjust to college, to facilitate their career planning, and to increase their motivation in pursuit of their goals.

To test the second hypothesis, Rotter's I-E scale was administered before, immediately after the sessions, and again after one to two months, and after seven months following the course. Since data for the follow-up studies were obtained from varying size random samples of the total student body, the number of subjects on retests who had taken the achievement motivation course decreased to eighty-four after the one to two month period, and to thirty-seven after the seven month period.

Results and Discussion

The results show a rather consistent increase in internal control following the achievement motivation sessions. For the 151 students, sixty-three females and eighty-eight males, undergoing achievement motivation training during the summer, the mean I-E scores increased from 13.40 to 15.40. The difference was

significant beyond the .01 level (t = 6.77). The difference was significant for both male and female students. There were no significant differences between males and females.

For the eighty-six subjects enrolled in the four two-weekend sessions the mean increases varied from 2.29 points to 3.69 for the four groups, and all were significant beyond the .01 level (t = 3.27 to 4.53).

After the one to two month period there was a mean decrease of .73 in the I-E scores for eighty-four of the high risk students taking the course during the summer. The decrease was significant at the .05 level (t = 2.21). However, the decrease was not large enough to wipe out all gains in the I-E scores from the first administration. An average increase of .75, significant at the .05 level, remained (t = 2.00). There were no significant sex differences. It should be pointed out that the first follow-up data were collected during orientation week, and perhaps some of the decrease in internality may have been due to feelings of uncertainty concerning one's role as a college student.

After the seven month period, the initial increase in internal control for the eight female students who were administered the scale for the fourth time had disappeared. For the twenty male students, however, a significant increment in I-E scores was still present. The mean remaining increment was 1.93, significant beyond the .05 level (t = 2.19). As can be seen, there was actually an increase in the male subjects from the third test to the fourth test administration.

During this same time period, the control subjects, that is, students not taking part in achievement motivation training, showed no significant changes in their I-E scores.

From these results, it can be concluded that the second hypothesis was partially supported. Achievement motivation training for males had immediate and relatively long-lasting effects on internal control as measured by the I-E scale. For females, a significant increase was present immediately after achievement motivation training, but dissipated over the seven month period.

The apparent sex difference after the seven month period could be due to the fact that only eight of the initial sixty-three females were retested for the fourth time, even though the selection of the eight was random. It may also be fruitful to

look at other possible explanations. Hochreich (1968) writes that there may be two types of seemingly external control individuals: one, the person who actually feels that his behavior consequences and his life chances are controlled by external forces; and, two, the person who is internal control oriented, but appears to show external control in order to defend himself against failure. Hochreich in his dissertation presents evidence suggesting that the defensive externals are more prevalent among males than among females, possibly because males in our culture have to bear more responsibility, and failure for a male may be more difficult to tolerate than for a female. Thus, in the present study, it may have been easier to increase internality in some males by removing verbal defenses against failure. Of course, the explanation does not fully answer the question, Why did females increase significantly in internality immediately following the achievement motivation sessions?

A second explanation for the sex difference is that because of early social learning the female students perhaps were not as career or competition oriented, and as a result the achievement motivation training procedures were less relevant to them than to the males. The females increased in internal control immediately following the training, but then may have discovered that the role they felt more comfortable with was not career or long-range goal oriented.

CONCLUSION

In general, the research at least partly supported the first hypothesis: internal reinforcement control was related to home environment. There were some interesting sex differences in both samples, the college students and early graders, with respect to the internal control-home environment relationship. In both samples it seemed that for males a warm, supportive, and consistent home related positively to internality. For females, however, the relationships were not as consistent, and suggested that somewhat rejectant home conditions which may force the female toward more independence provided opportunities for developing a feeling of internal control.

The second hypothesis was supported by the finding that feelings of internal reinforcement control increased in early graders and college students at the conclusion of special counseling efforts. For males there was definite evidence that achievement motivation training produced an increase in internality that was still significant after a seven-month period.

The secondary hypothesis of a positive relationship between school achievement and internal control was supported in the early graders. It is, of course, likely that the relationship between internality and achievement level was due to the relationship between intelligence and internality. Intelligence was the best predictor of school achievement level. There was no grade-point average-internal control relationship in the college students.

APPLICABILITY OF RESULTS

The importance of having a belief in internal reinforcement control was, at least conceptually, justified in the introductory section of this report. The present research has added evidence that at least in the early grades, children with feelings of internal control had better grades than those with external control. The relationships were not very strong. For example, intelligence was a much better predictor of grades. More research is necessary to answer questions concerning the grade-internality relationship. It may be that a child develops internal control as a result of successful school experiences and not necessarily vice versa. It is possible that internality relates to grades because it also relates positively with intelligence.

The likelihood should also be pointed out that by the nature of internality a very high belief in internal reinforcement control may be undesirable. There are events that happen in this world purely or partly on basis of chance. A current example is the draft lottery. Other examples are low reliability grading procedures as used by various teachers. An individual who feels he is in full and complete control of everything that happens to him would lead a very frustrating life. He would be forced to change his views or withdraw from society. Research needs to be conducted to find information concerning what levels of internality are most effective in what situations.

Perhaps the most important finding in terms of applicability is that internal reinforcement control can be modified. Special counseling procedures can be set up in order to increase feelings of internal reinforcement in college students and early graders. The question, of course, always remains open as to whether a verbal change on the scale also implies a behavioral change. More research is being planned to answer this question. There seem to be no basic reasons to assume that verbal behavior change on the scale would not be accompanied by behavioral change, especially since definite behavior changes were subjectively apparent in college students during internal reinforcement counseling sessions. A number of students took action illustrating that after counseling they felt responsible for their future plans, what they did, and how they were going to reach their goals. In the same way, it was apparent that the early graders who received more

individual attention during the teachers' attempts to clarify behavior-effect contingencies changed quite radically in their class-room behavior.

Thus it seems that procedures could be developed at educational institutions to facilitate the development or increase in internal reinforcement control. It seems that children coming from economically underprivileged backgrounds could benefit most from internal reinforcement training. In economically underprivileged homes the parents may not have enough time or knowledge to provide a supportive and consistent environment, and children from economically underprivileged homes will sooner have to face life's reality in terms of earning money for education or in planning their careers as compared to children whose parents are economically more independent. If the economically underprivileged youngster behaves as one with belief in external reinforcement control, most probably by the time he is a junior or senior in high school he will begin to drift from job to job trusting in luck or the benevolence of others to guide him. The internal control youngster more probably would have a clearer idea of his goals and how to go about attaining them.

In considering the applicability of internal reinforcement control counseling, it is important to remember the limitations of reality. Training or counseling should not be conducted in isolation from life's realities. It is important for the individual to know what alternatives or choices exist for him in his life setting. Battle and Rotter (1963), for example, report that brighter lower-class Negroes may develop extreme external control belief as a defense against reduced choices for cultural or material rewards.

The finding that home environment relates to locus of control is of much practical significance for parents. It seemed that somewhat different home environments are necessary for development of internality in boys than in girls. The author's view is that for boys a consistent and supportive environment is important. For girls, in order to develop internality, more stress should be placed on independence training than is generally the practice in our culture. If a great deal of dependency is encouraged in the girl, then, of course, external rather than internal reinforcement control develops.

On basis of informal communications the results of this study are already finding some applicability. The college at which the present research was conducted has reaffirmed its

commitment to psychological education techniques. Plans are under way to incorporate internal control training in the local school system's Head Start program. The counseling methods developed in this study have also been communicated to the Research and Training Center at West Virginia University where it will become part of the program to train economically underprivileged high school students in health service fields. Finally, a collaborative project has been set up between the staff of the Research and Training Center at West Virginia University and the director of this project to write a monograph on the applicability of internal reinforcement control training in the field of rehabilitational counseling.

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